

What is claimed is:

1. An apparatus for the destruction of explosively configured chemical munitions, comprising:
  - (a) an explosive containment vessel, said vessel having a sealable door, inlet means for electrical feed-through, inlet means for treatment chemicals, and outlet means for removing chemical effluent;
  - (b) a fragment suppression system contained within said explosive containment vessel, said fragment suppression system holding said munition within said vessel and mitigating high velocity fragments and absorbing shock upon detonation of said munition; and
  - (c) means for explosively accessing the interior of said munitions when contained within said fragment suppression system.
2. The apparatus of claim 1, wherein said sealable door includes an all-metal seal, and said sealed vessel has a helium leak rate of less than about  $1 \times 10^{-3}$  mbar-l/sec at a minimum pressure differential of 50 psi.
3. The apparatus of claim 2, wherein said all-metal seal comprises a Grayloc® all metal seal.
4. The apparatus of claim 2, wherein said seal maintains said leak rate before, during, and after detonation of said munition.
5. The apparatus of claim 1, further comprising a protector plate mounted to the interior of said door so that said electrical feed-through, said inlet means, and said outlet means are shielded from detonation fragments.

6. The apparatus of claim 1, wherein said vessel is capable of containing at least 500 individual detonations of about 1.0 pound of TNT.
7. The apparatus of claim 1, wherein said vessel is capable of containing at least 500 individual detonations of about 3.5 pounds of TNT.
8. The apparatus of claim 1, wherein said fragment suppression system comprises a hollow steel cylinder having end-plates so that said cylinder surrounds said munition, and includes means for supporting said cylinder within said vessel, said fragment suppression system being a sacrificial structure which absorbs fragment energy upon detonation of said munition.
9. The apparatus of claim 8, further comprising a stopper block positioned beneath said cylinder so that any shaped charge jet penetrating said munition and fragment suppression system is stopped without penetrating said stopper block.
10. The apparatus of claim 1, wherein said accessing means comprises at least one shaped charge positioned around said munition within said vessel.
11. The apparatus of claim 10, wherein said at least one shaped charge comprises a linear shaped charge to open the main body of the munition thereby exposing the munition contents.
12. The apparatus of claim 10, wherein said at least one shaped charge comprises a plurality of shaped charges positioned around said munition in said vessel.
13. The apparatus of claim 12, wherein said plurality of shaped charges comprises a linear shaped charge to open the main body of the munition, and at least one conical shaped charge to break open a burster section in said munition.

14. The apparatus of claim 10, wherein said shaped charges are electrically initiated using electrical power provided through said electrical feed-through inlet means.
15. The apparatus of claim 1, further comprising means for heating said vessel.
16. The apparatus of claim 15, wherein said heating means comprises a plurality of band heaters surrounding said vessel.
17. The apparatus of claim 15, wherein said heating means is capable of heating fluids within said vessel to about 100°C.
18. The apparatus of claim 1, further comprising a source of treatment chemicals connected to said inlet means for treatment chemicals.
19. The apparatus of claim 18, wherein said source of treatment chemicals comprises a plurality of supply tanks.
20. The apparatus of claim 19, wherein said supply tanks contain individual sources of treatment chemicals selected from the group consisting of aqueous hydroxide, water, denatured alcohol, acetone, mono-ethanolamine, aqueous bisulfite, hydrogen peroxide, aqueous hypochlorite, and dichloro-dimethylhydantoin.
21. The apparatus of claim 18, wherein said source of treatment chemicals is capable of heating said treatment chemicals.
22. The apparatus of claim 1, wherein said inlet means for treatment chemicals comprises at least one spray nozzle.
23. The apparatus of claim 1, further comprising means for agitating said vessel.
24. The apparatus of claim 23, wherein said means for agitating comprises an hydraulically driven oscillating mechanism.

25. The apparatus of claim 24, wherein said mechanism oscillates said vessel from about +40 degrees to -40 degrees from the horizontal position.
26. The apparatus of claim 23, wherein said means for agitating comprises a motor-driven mechanism rotating said vessel about its longitudinal axis.
27. The apparatus of claim 1, further comprising means for sampling the contents of said vessel.
28. The apparatus of claim 27, wherein said sampling means is capable of sampling both liquid and gas samples from the contents of said vessel.
29. The apparatus of claim 1, further comprising a trailer so that said vessel can be mounted on said trailer and made portable.
30. An apparatus for destroying explosively configured munitions, comprising:
- (a) an explosive containment vessel, said vessel having a sealable door, inlet means for electrical feed-through, inlet means for treatment chemicals, and outlet means for removing chemical effluent;
  - (b) a fragment suppression system positioned within said explosive containment vessel, said fragment suppression system holding said munition within said vessel and mitigating high velocity fragments and absorbing shock upon detonation of said munition;
  - (c) at least one shaped charge positioned proximate said munition for explosively accessing the interior of said munition when contained within said fragment suppression system;
  - (d) means for heating said vessel;

- (e) a source of treatment chemicals connected to said inlet means for treatment chemicals, and wherein said source of treatment chemicals is capable of heating said treatment chemicals;
- (f) means for agitating the contents of said vessel; and
- (g) means for obtaining both liquid and gas samples from said vessel's contents.

31. The apparatus of claim 30, wherein said apparatus is mounted on a trailer so that said apparatus is made portable.

32. A method for destroying explosively configured chemical munitions, comprising the steps of:

- (a) placing said munition within an explosive containment vessel, said vessel having a sealable door, inlet means for electrical feed-through, inlet means for treatment chemicals, outlet means for removing chemical effluent, and a fragment suppression system surrounding said munition, said fragment suppression system mitigating high velocity fragments and absorbing shock upon detonation of said munition;
- (b) placing at least one shaped charge adjacent to said munition;
- (c) sealing said vessel door;
- (d) initiating said at least one shaped charge thereby cutting open said munition; and
- (e) introducing treatment chemicals into said vessel.

33. The method of claim 32, wherein step (d) comprises initiating said at least one shaped charge thereby cutting open and detonating said munition.

34. The method of claim 32, further comprising the step of heating said vessel while introducing said treatment chemicals.
35. The method of claim 34, further comprising the step of agitating said vessel after introducing said treatment chemicals.